

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-25 and 28-34 are now pending in this application.

Rejection Under 35 U.S.C. § 112

Claim 34 is rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Applicant respectfully submits that the amendments to the claims render this rejection moot. Reconsideration and withdrawal of this rejection is respectfully requested.

Rejection Under 35 U.S.C. §102

Claims 1-4 and 34 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent 5,006,178 to Bijvoets (hereafter "Bijvoets"). Applicant respectfully traverses this rejection for at least the reasons set forth below.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See generally MPEP § 2131.

Bijvoets discloses a thermoelectric device that includes thermoelectric elements 4 formed by element halves 6, 7, with an element half 6 including two P conductivity type semiconducting pieces 8 and an intermediate piece 9, and with an element half 7 including

two N conductivity type semiconducting pieces 10 and an intermediate piece 9. See col. 2, line 52, to col. 3, line 3, of Bijvoets. The thermoelectric elements 4 are connected by bridges 5. See col. 2, lines 54-55, of Bijvoets. Bijvoets also discloses that the semiconducting pieces 8, 10 can be made of BiTe and that the intermediate pieces 9 can be made of copper. See col. 4, lines 24-26, and col. 5, lines 7-21, of Bijvoets.

However, Bijvoets fails to disclose a thermoelectric effect device comprising, among other things, a first thermoelectric converter element and a second thermoelectric converter element, wherein each thermoelectric converter element comprises a first electric conductor member and a second electric conductor member which have different Seebeck coefficients from each other and a joint member that joins the first electric conductor member and the second electric conductor member, having the configuration recited in claim 1, wherein a Peltier effect heat transfer circuit system is configured such that one of the first and second thermoelectric converter elements includes the endothermic section at a boundary between the joint member and the first electric conductor member and at a boundary between the joint member and the second electric conductor member of the one thermoelectric converter element, and an other of the first and second thermoelectric converter elements includes the exothermic section at a boundary between the joint member and the first electric conductor member and at a boundary between the joint member and the second electric conductor member of the other thermoelectric converter element, as recited in claim 1. Claims 2-4 include similar features.

For example, Figure 2 of Applicant's disclosure provides an exemplary arrangement in which a first thermoelectric converter element 10 can include endothermic sections at boundaries between the joint member d13 and the first and second electrical conductor members A11, B12, and in which a second thermoelectric converter element 20 can include exothermic sections at boundaries between the joint member d23 and the first and second electrical conductor members A21, B22.

Conversely, Bijvoets provides an arrangement in which, when a current flows in a positive direction through items 9, 10, 5, 8, and 9 of Bijvoets, exothermic sections are provided between bridges 5 and the P and N conductivity type semiconducting pieces 8, 10,

and in which endothermic sections are provided between intermediate pieces 9 and the P and N conductivity type semiconducting pieces 8, 10. If the current direction is reversed the locations of endothermic sections and exothermic sections would be reversed.

In addition, Bijvoets does not disclose the arrangement of electric conductor members, joint members, and electric conduction material recited in claims 1-4 because sides of the the P and N conductivity type semiconducting pieces 8, 10 that contact the intermediate pieces 9 or bridges 5 do not face one another, as recited in claims 1-4.

Therefore, the device of Bijvoets does not anticipate claims 1-4 because the device of Bijvoets does not provide the distances recited in claims 1-4. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 1-4 are rejected under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Pub. No. 2003/0230332 to Venkatasubramanian *et al.* (hereafter “Venkatasubramanian”). Applicant respectfully traverses this rejection for at least the reasons discussed below.

Venkatasubramanian discloses a thermoelectric device that includes thermoelectric elements of opposite conductivity type located on respective opposing sides of a heat source member. See abstract of Venkatasubramanian. Venkatasubramanian further discloses heat sinks disposed on opposite sides of the thermoelectric elements Peltier metal contacts positioned between the thermoelectric elements and each of the heat source member and heat sinks. See abstract of Venkatasubramanian.

However, the device of Venkatasubramanian includes N-type and P-type semiconductors in the order of N-P-N-P-N-P-N. Thus, Venkatasubramanian does not disclose a device wherein the first thermoelectric converter element and the second thermoelectric converter element are arranged in the Peltier effect heat transfer circuit system such that the first electric conductor members and the second electric conductor members do not alternate with one another, as recited in claims 1-4. Furthermore, Venkatasubramanian

does not disclose the arrangement of electric conductor members, joint members, and electric conduction material recited in claims 1-4.

Applicant respectfully reserves the right to overcome this rejection by submitting a translation of the foreign priority papers or submitting other evidence of date of invention prior to the filing date of Venkatasubramanian.

In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of this rejection.

Rejections Under 35 U.S.C. §103

Claim 5 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bijvoets in view of U.S. Patent 6,271,459 to Yoo (hereafter “Yoo”).

Claims 6 and 7 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bijvoets in view of U.S. Patent 6,100,600 to Pflanz (hereafter “Pflanz”).

Claims 8, 9, 11, 12, 14, 15, 17, 18, 20, 21, 23, and 24 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bijvoets in view of U.S. Patent 5,987,891 to Kim *et al.* (hereafter “Kim”).

Claims 10, 13, 16, 19, 22, and 25 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bijvoets in view Yoo and further in view of Kim.

Claims 28, 29, 31 and 32 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bijvoets in view of Kim and further in view of Pflanz.

Claims 30 and 33 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bijvoets in view of Yoo and further in view of Kim and Pflanz.

Applicant respectfully traverses these rejections. Yoo, Pflanz, and Kim fail to remedy the deficiencies of Bijvoets discussed above. Therefore, the combinations of Bijvoets with Yoo, Pflanz, and/or Kim set forth by the Office above fail render claims 5-25 and 28-33 as unpatentable.

In view of the foregoing, Applicant respectfully requests reconsideration and withdrawal of the outstanding rejections under §103.

Provisional Obviousness-Type Double Patenting Rejections

Claims 1-25 and 28-34 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 1-15 of co-pending Application No. 10/537,357.

Inasmuch as this is a *provisional* rejection, Applicant respectfully requests that the Office hold this rejection in abeyance while the prior art rejections are resolved. Applicant also reserves the right to take further action should the rejection become non-provisional.

Conclusion

Applicant submits that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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